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Determination of adsorption isotherms of organic compounds on human serum albumin by static headspace gas-chromatographic analysis

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Abstract

A procedure is suggested for determination of adsorption isotherms of organic compounds on a protein via the procedure of static headspace gas-chromatographic analysis. With this technique, the n-propanol and n-undecane adsorption isotherms on human serum albumin (HSA) were measured. To test the procedure, the adsorption isotherms of n-octane, n-propanol, and toluene on porous silica Cabosil M5 were determined. The sorbate monolayer volume, adsorption equilibrium constant, and specific surface area were calculated by the BET equation for these systems. It was shown that, unlike the case of porous silica for which the specific monolayer volume is virtually independent of the sorbate type, the volume of n-undecane monolayer on HSA is almost 400 times less than that of water monolayer on horse serum albumin and other proteins.